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EXAMINER

JONES, JAMES

ART UNIT	PAPER NUMBER
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2873

NOTIFICATION DATE	DELIVERY MODE
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12/01/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 10/549,511	Applicant(s) GROSS, MICHEL JEAN	
	Examiner JAMES C. JONES	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8, 24 and 26-28 is/are rejected.
- 7) ☒ Claim(s) 5-7, 9-23 and 25 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/2/2006 & 5/19/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 2/2/2006 and 5/19/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claim 7 is objected to because of the following informalities: the arrow after the word "frequency" should be deleted, this typographical error can be found on line 10 of claim 7. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2873

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

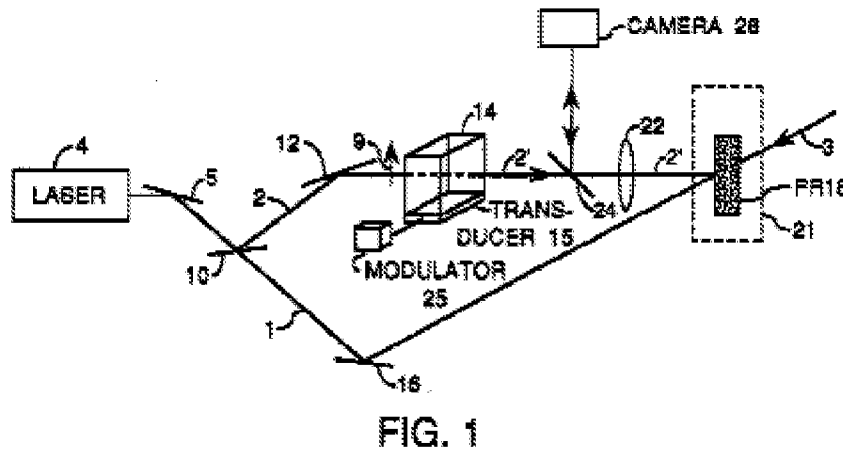
Claims 1-4, 8, 24, and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Khoury et al (5684588) hereafter Khoury.

Khoury discloses the limitations therein including the following:

Regarding claims 1 and 26, Khoury discloses in figs. 1, 2, 3, a method of acousto-optical imaging of an object to be imaged comprising the steps consisting in: (a) generating an incident optical wave, of frequency $f_{\text{sub.I}}$, and a reference optical wave ("1" as the "reference wave"), of frequency $f_{\text{sub.R}}$, this reference wave being coherent with the incident wave ("2" as the "incident wave"), and exhibiting therewith a known phase difference $\phi_{\text{sub.i}}(t)$, (b) vibrating in a first object direction and at an acoustic frequency $f_{\text{sub.A}}$, a zone of the object ("9" as the "object") to be imaged with the aid of a vibration generating device ("15" as the "vibrating device"), (c) applying said incident wave to the object to be imaged, and thus generating a scattered signal wave, (d) applying at least a part of the scattered signal wave to a detection device, (e) applying the reference wave to the detection device ("21" as the "detector") without making it pass through the object to be imaged, thereby generating at the point r of the detection device (21) an interferogram $I(r, t)$ varying over time t , (f) extracting a digital information item from the interferogram $I(r, t)$ ("26" as the "interferogram"), and (g) obtaining the coordinates of a point of measurement of the object to be imaged, to which the digital information item relates (fig. 1, 2, 3, col. 2, lines 3-60 note: the coordinates of the object will be obtained by the camera "26" because the camera

Art Unit: 2873

records the image of the object).



Regarding claim 2, Khoury discloses the method of acousto-optical imaging as claimed in claim 1, in which in the course of step (f), an acoustic component of the part of the scattered signal wave applied to the detection device is detected (col. 2, lines 3-38), this acoustic component being at a frequency corresponding to the sum of the frequency $f_{\text{sub.I}}$ of the incident wave and of a harmonic of the acoustic frequency $f_{\text{sub.A}}$ (col. 2, lines 53-61).

Regarding claim 3, Khoury discloses the method of acousto-optical imaging as claimed in claim 2, in which, in the course of step (a), said reference wave is generated at a frequency $f_{\text{sub.R}}$ equal or substantially equal to the sum of the frequency $f_{\text{sub.I}}$ of the incident wave and of said harmonic of the acoustic frequency $f_{\text{sub.A}}$ (col. 2, lines 43-45).

Regarding claim 4, Khoury discloses the method of acousto-optical imaging as claimed in claim 3, in which in the course of step (b), an acoustic wave is generated, focused at a focal point situated in the object to be imaged (fig. 1, col. 2, lines 53-67),

Art Unit: 2873

and in which, in the course of step (g), the coordinates of the measurement point are obtained as being the coordinates of said focal point (fig. 1, 2).

Regarding claim 8, Khoury discloses the method of acousto-optical imaging as claimed in claim 1, in which at least steps (a) to (g) are repeated after having imposed a displacement of the vibration generating device relative to the object to be imaged along a direction not parallel to the first object direction (x.sub.o) of the object to be imaged (fig. 1, col. 2, lines 54-65).

Regarding claim 24, Khoury discloses the method of acousto-optical imaging as claimed in claim 1 in which the object to be imaged is a biological tissue (col. 3, lines 10-11).

Regarding claim 27, Khoury discloses the installation for acousto-optical imaging as claimed in claim 26 furthermore comprising the following elements: means for visualizing said digital information item relating to said point of measurement of the object to be imaged (fig. 1 or 3 "9" as the "object image"), and means for displacing the object to be imaged (fig. 1 or 3).

Regarding claim 28, Khoury discloses the installation for acousto-optical imaging as claimed in claim 26, furthermore comprising a spatial filtering device situated downstream of the object to be imaged (col. 3, line 2).

Allowable Subject Matter

Claims 5-7, 9-23 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art either alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103.

Regarding claim 5, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed "in which steps (a) to (g) are repeated for various focal points of the acoustic wave in the object to be imaged, these various focal points being aligned along the first object direction"

Regarding claim 6, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed "at least one digital information item is obtained by decoding said digital information items obtained in the course of steps (f) of each iteration as a function of the frequencies used, and in which, in the course of step (g), the coordinates of at least one point of measurement of the object to be imaged to which the digital information item obtained in the course of step (f') relates are obtained, by decoding the said digital information items obtained in the course of steps (f) of each iteration as a function of the frequencies used".

Regarding claim 7, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed "1D frequency time Fourier transformation is performed, for each pixel r , according to the frequency $f_{\text{sub.A}}$ of the interferogram $I(f_{\text{sub.A}}, V, W, r)$, and at least one interferogram

Art Unit: 2873

$I(r)$ associated at least with a measurement point with coordinates is obtained by replacing the time obtained after the Fourier transform with the magnitude U' along the first object direction ($x_{\text{sub.o}}$) with the aid of the speed of propagation of the acoustic wave in the object to be imaged”.

Regarding claim 9 (and its dependents), none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed “which in the course of step (f), the complex amplitude $E_{\text{sub.s}}(r)$ of the acoustic component is estimated on the basis of the interferogram $I(r, t)$ ”.

Regarding claim 20, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed “a semireflecting mirror, transmits a part of the lateral band wave and a part of the carrier wave forming the incident wave, and reflects a part of the carrier wave and a part of the lateral band wave forming the reference wave”.

Regarding claim 21, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed “a second acousto-optical modulator intercepts the first frequency shifted wave and generates a second frequency shifted wave, the frequency of which is shifted by a value $\Delta f_{\text{sub.2}}$, possibly negative, with respect to the shifted wave, the second frequency shifted wave forming the reference wave, the frequency of which is thus shifted in

Art Unit: 2873

frequency with respect to the incident wave by a value Δf -

$\Delta f_{sub.1} + \Delta f_{sub.2}$, thus determining a known phase difference $\phi_{sub.i}(t)$ between these two waves”.

Regarding claim 22, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed “two independent laser sources, locked in phase by electronic slaving, generate the incident and reference waves, exhibiting a known phase difference $\phi_{sub.i}(t)$ between them”.

Regarding claim 23, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed “a second acousto-optical modulator intercepts the first frequency shifted wave and generates a second frequency shifted wave, the frequency of which is shifted by a value $\Delta f_{sub.2}$, possibly negative, with respect to the shifted wave, the second frequency shifted wave forming the reference wave, the frequency of which is thus shifted in frequency with respect to the incident wave by a value $\Delta f = \Delta f_{sub.1} + \Delta f_{sub.2}$, thus determining a known phase difference $\phi_{sub.i}(t)$ between these two waves”.

Regarding claim 25, none of the prior art either alone or in combination disclose or teach of the claimed method of acousto-optical imaging specifically including as the distinguishing features in combination with the other limitations the claimed “vibration generating device is used to obtain an acoustic cue of the zone of the object to be

Art Unit: 2873

imaged, and in which the digital information item extracted in step (f) is used jointly with said acoustic cue”.

Conclusion

Labrum (4696061) is being cited herein to show a reference that discloses some similar features to that of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES C. JONES whose telephone number is (571)270-1278. The examiner can normally be reached on Monday thru Friday, 8 a.m. to 5 p.m. est. time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/549,511

Page 10

Art Unit: 2873

/James C. Jones/

Examiner, Art Unit 2873

11/22/2008

/Ricky L. Mack/

Supervisory Patent Examiner, Art Unit 2873